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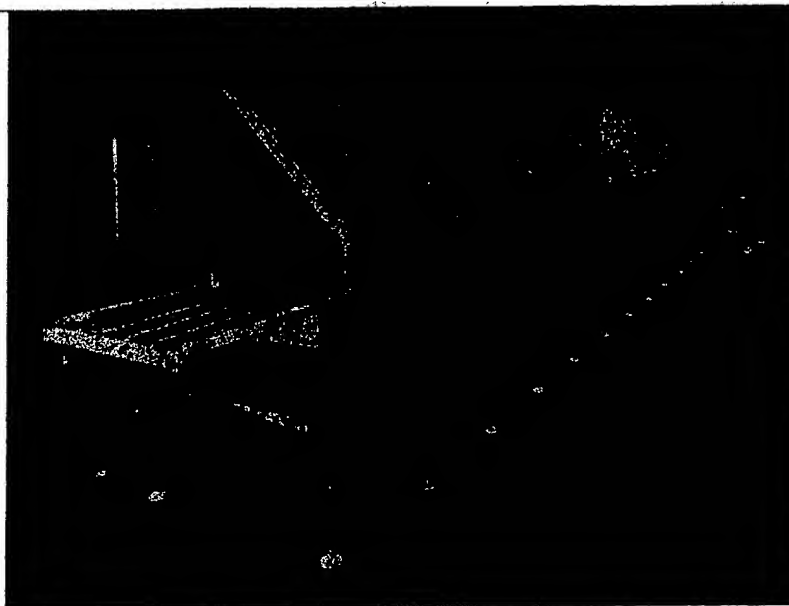
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The RapidFlow Oven is the most versatile linear cooker/roaster/smoker in the market, with a temperature range from 0°C. To 350°C. The oven can run as a linear steamer, roaster or combination. It is a modular oven, expandable from 1 zone to 6 zones.

We have customers cooking chicken parts, roasting vegetables, smoking turkeys, and searing barbecue ribs. Many of the ready-meal companies use the oven to cook 15 to 20 different products daily.

Test cook with us at Ponca City, Oklahoma or Manchester, England.



See how these two case studies could affect your business:

In-Line Smoking and Browning

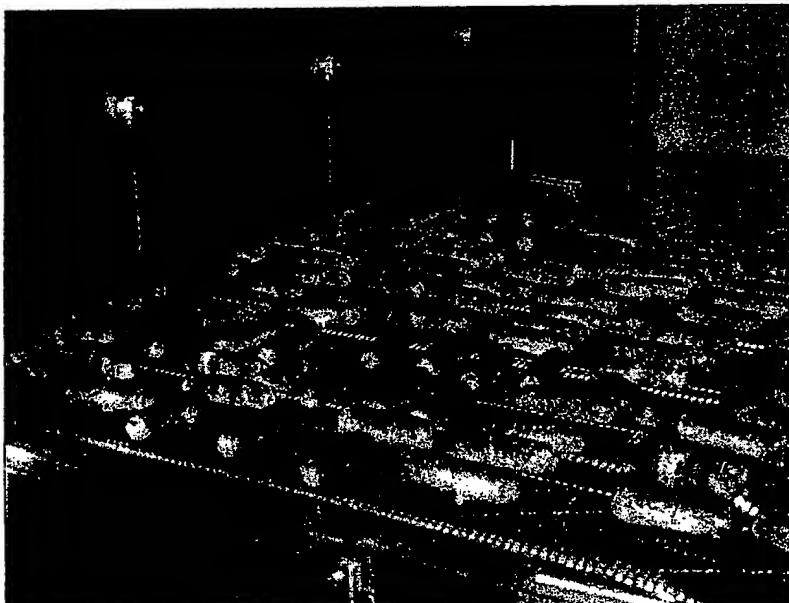
Traditionally, it takes 3 1/2 hours to smoke a deli turkey, with shrinkage of 7 to 9 percent. The RapidFlow smokes turkeys and hams in 10 minutes. The shrinkage is 1% and the internal temperature only increases by 1° C. This relieves your existing smokehouses by 40% of the time and gives you a payback of \$10,000 per day, based on 10,000 lbs. Per hour of production.

Sausage Links

The illustration is for 8 links to the lb. of sausage. Regardless of how you load the sausage links onto the RapidFlow oven belt, it browns them all the way around. Links are cooked in 5 minutes, with a cook yield of 94%.

UNITHERM Food Systems, Inc.
1108 West Hartford Ave.
Ponca City, Oklahoma 74601
Tel: (405) 762-0197
Fax: (405) 762-0199
e-mail: unitherm@pcok.com

UNITHERM Food Systems, Ltd.
Bailey Road
Trafford Park
Manchester M17 1SA
Tel: 0161-848-8954
Fax: 0161-848-8955
e-mail: unithermuk@aol.com



Circle #350 on Reader Service Card

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U-8329

PTO-003826

UNITHERM

STAINLESS STEEL INC.

1680-82 CARMEN DRIVE • ELK GROVE VILLAGE, ILLINOIS 60007 U.S.A.
TELEPHONE: 708.806.0454 • FAX: 708.806.1321

NEW PRODUCTS FOR THE U.S. MARKET

Unitherm stainless steel now manufacturing at Elk Grove village, Illinois used the Atlanta Poultry exposition to launch their U.S. operation.

The stand featured the Rapid Flow II continuous roaster cooker. in an attempt to differ from other exhibitors Unitherm had a production model (50' long) in running mode.

Production was undertaken for 8hrs per day. Two products were cooked to demonstrate the control of heat technology.

Product 1

3lb chickens were cooked continuously, the cook time was 60 minutes and cook weight (yield) 80%. This is 11% better than any alternative system. Rapid Flow's success is linked to large volumetric changes of convected super heat.

The even heat distribution creates the equilibrium of the cook, leaving unchallenged uniformity in color (this is not impingement).

Product 2

Sliced bacon: 35 slices per lb.

A Grote slicer was linked to the machine to create easy bacon transfer.

Cook time was 2 minutes and the yield 35%. Product was dark and golden in appearance. Texture was crispy.

The advantage of showing bacon being cooked at an exhibition is:

1. That it demonstrates how uniquely safe the Rapid Flow is when dealing with historically flammable products.
2. By cooking such a thin product, 1.5mm thick, without charring or burning. The benefits of superheat working can be witnessed.

This product portrays even heat distribution, our competitors would never attempt this.

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U-8170

Let me give you a laymens definition of superheat:

Fact - There is no humidity above 100 degrees C at atmospheric pressure.

Therefore at nominally 100 degrees C increasing the energy input to the vapor does not increase the temperature of the vapor but changes its state from wet vapor to dry saturated vapor, this is termed the latent heat of evaporating. Further energy input increases the temperature and this is termed superheat.

Therefore introducing moisture to an oven at say 250 degrees C has the effect of greatly increasing the energy per unit volume of the oven.

What we seek to control is saturation of the cooking zone with this vapor. In Rapid Flow II this is automatically done, when the machine is put i to working mode, all the programs are pre-set at our manufacturing plant. There is no "tweaking" required. We do not expect your operator to be a science graduate, therefore the operator merely controls temperature and belt speed (cook time).

Back to bacon

When the bacon enters the cooking zone it will be at a temperature of -4 to -6 degrees centigrade. Much like the vapor from the kettle contacting the ambient air and condensing, the chilled bacon forces the vapor to condense against it. This gives the product a protective layer. The vapor is denser than air, therefore it is more efficient in transferring its energy into the food product. The nett result is shorter cook time and a better yield.

Rapid Flow is a modular cooking system. The machine photographed here at the show is a 3 zone model, this can be built up to 8 zones long. Clearly your production growth can be achieved by adding zones.

Temperature control is +1 or -1 degree in each zone. This allows you to create cooking profiles for individual products.

PTO-003828

U-8171

Also Featured on the Unitherm Stand was:

- 1. Aqua Flow - continuous vegetable / pasta cooker.**
- 2. Stainless steel drainage systems.**
- 3. Robeflow - Enrober**
- 4. Chicken stripping line.**
- 5. Flow Stream - Continuous or batch steam cooking:**
- 6. Cook Chill - skinless sausage system.**
- 7. Graduator Cutter - Pasta lasagne, pizza bases.**
- 8. Mechanical handling systems for food factories.**

PTO-003829

SCHEDULED VISITS & *TESTING*

Jan. 06	BRYAN FOODS
Jan. 07	Wayne Rice CUSTOM RIBS
<i>Jan. 06 or 07</i>	<i>INT'L TRADING CO.</i> <i>Testing Product</i>
Jan. 16 - 17	WILSON FOODS
Jan. 20	ZACKY FARMS
Jan. 27	FOSTER FARMS
Jan. 28 - 29	HUDSON FOODS

These are 90% certain, but there still could be changes.

Per Jerry Adams

PTO-003830

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UNITHERM STAINLESS STEEL INC.
1680-82 CARMEN DRIVE, ELK GROVE VILLAGE, ILLINOIS, 60007.
TEL: 708 806 0454 FAX: 708 806 1321.

*File: Unitherm
Re: New Products*

UNITHERM, the British engineering company which opened in Chicago two years ago has had good success with their RAPIDFLOW CONTINUOUS CONVECTION OVEN and has recently launched two new innovations in cookers -- the ROTACHEF and AQUAFLOW.

ROTACHEF is a continuous rotisserie oven used by one Chicago customer for the roasting and basting of baby back ribs. The process takes about forty-five minutes, after which the ribs can be coated with a tasty barbecue sauce and caramelized in a high temperature RAPIDFLOW. Tested on poultry and other products, UNITHERM expects this to be another successful product.

AQUAFLOW, a continuous water bath cooker or cooler has such a wide variety of uses that not even UNITHERM has had a chance to review all of its potential. At the recent International Exposition IPA - MATIC in Paris, visitors suggested it be used for cooking and immediate chilling of products as diverse as salad carrots, broccoli, prawns, Antarctic Krill, as well as portion packed chicken breast and pasta. The cooker is loaded with batches up to thirty pounds in weight either manually or by in-feed conveyor having a capacity up to one thousand pounds of product per hour, depending upon heat and retention time required.

For Further Information Contact: Mr. Bobby Cox
Unitherm Stainless Steel, Inc.
1680-82 Carmen Drive
Elk Grove Village, Illinois 60007
Telephone Number: (708) 806-0454
Facsimile Number: (708) 806-1321

NTLPROVS.LBR { *this is our code & did not appear on mailed original; for our use only.*

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U-8178

Mesquite Smoked



Hickory Smoked



Hams



UNITHERM Food Systems, Inc.										Date:
Cooking Trial Data					Product: 1/4					Supplied By:
Test #	Belt Speed	Cook Time	Temperatures C.		Start Weight	Cooked Weight	Yield	Internal Temp. F.	Remarks	
			Zone 1	Zone 2						
#1			350°		9.42	9.08	96.3		Super Poly	
#2			350°		9.31	8.97	96.3		063 Smoke	
#3			350°		9.27	8.95	96.5		42°F Int 52°F Ext	
#4					9.02	8.77	97.2		108° Surface 44°F Int	
#5					9.50	9.21	96.9			
#6					9.54	9.25	97.0		62° Ext of pack	
NOTES										
#1	9.32 9.14 9.11 98.1									
#2	9.41 9.08 9.56									
#3	9.47 9.20 9.17 97.1									
#4	9.24 9.01 9.78									
#5	9.34 9.05 9.30 97.0									
#6	9.31 9.03 9.08 97.0									
	8.99 8.75 8.70 97.10									
	0.00 0.00 0.00 0.00									

U-05589

AUSTIN SMALL CURIES[®] Heat Processing Cycle (148-150°F)

<u>Time (Minutes)</u>	<u>DRY Bulb, °F</u>	<u>Wet Bulb, °F</u>	<u>%RH</u>	<u>DAMPEN setting</u>	<u>EXHAUST FAN</u>	<u>SMOKE</u>
30	140	110	38	AUTO	HIGH	OFF
60	150	125	48	AUTO	LOW	OFF
60	150	125	48	AUTO	OFF	ON
60	150	130	56	AUTO	OFF ?	OFF
60	160	140	57	AUTO	LOW	OFF
30	170	150	59	AUTO	OFF ?	OFF
*	0	160	100	STEAM ON	OFF	OFF

* TO 148-150°F

OSCEOLA FOODS SMALL CURIES[®] Heat Processing Cycle (170°F)

<u>Time (Minutes)</u>	<u>DRY Bulb, °F</u>	<u>Wet Bulb, °F</u>	<u>%RH</u>	<u>SMOKE</u>
60	150	117	37	—
60	150	120	41	—
75	150	122	44	ON
45	160	134	49	ON
60	160	140	57	—
60	170	150	59	—
60	180	155	54	—
60	0	175	100	—
120 *	0	185	100	—

* 170°F

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U-06901

PTO-003834

Unithen Room

^{Minimum}
Daily Sanitation
Cleaning Protocol

1. Take out bare
2. Remove white bag in smoke
3. Remove all CIP + Belt wash screens
4. Check + clean all reservoirs
5. Run CIP with Hydrosol - 1st cycle
" with AP 181 Acid - 2nd cycle
Rinse with high pressure by hand
SA - clean floor + drains of product
6. ~~Sanitary~~ Contractor inspect for cleanliness
7. 74 - Pre Op - pass
- 7B. Pre-Op fails - return

Weekly

Clean Smoke stack

Remove any + all residue + char from ^{dry} pans etc

Clean upper grate of oven

Clean oven inside of the side doors

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PTO-003835

What is it that
the indexer is
doing today.

Going from side to side
with out stopping for

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U-06960

PTO-003836

Bag splitter

- Bowls turning by knife
- Bowls hanging up on Rails.
- * Safety valve for cover.

I.R.

- Speed

Indexer

- switches. -- Not up to code >>

Smoker.

- sockson Both canisters.

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PTO-003837

* Mount Filters Vertically

* Drain Valve on Filter Systems

* Drain Valve on Nipple Feed Pipe

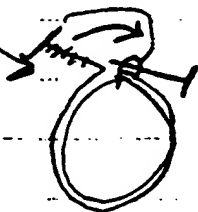
* Removable Nipple manifolds

* SS welded nuts to support nipples in manifold

* Hard water pipe to mix tank

* Graduated Blend tank

* Mesh Bag Filter for smaller Nipples



Anti-leak - 4-6 oz

58% 11 gallons

* 625/550°

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PTO-003838

Tag # _____ Correct Identification # _____

7 _____ 3486

Settings - 70% Zone 1 - 626 Zone 2 - 626 66, 65 H2

3246 → Infrared (13/min) into oven
- WIP Brings RACKS

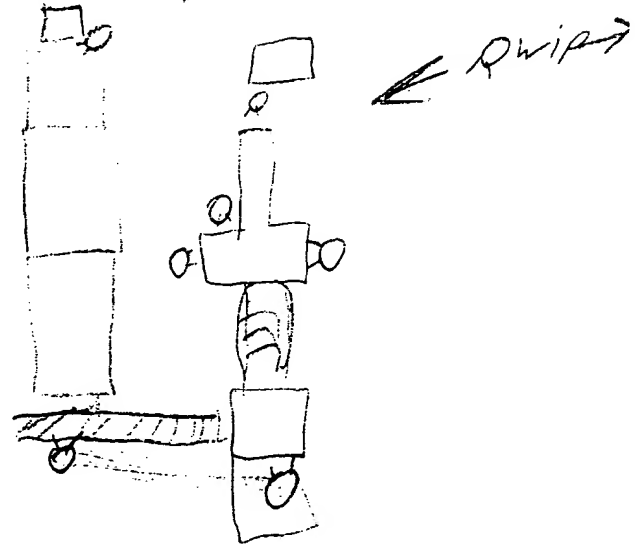
Unrack - 1

Strip/Enter Infrared - 3

Exit Infrared - 1

Load UnitTherm - 1

Rack - 1



Based
on
10 Lb./unit
9 hrs/day

13/min

160 units/Rack

12.3 min/Rack

4.88 Racks/hr.

1,600 Lbs./Rack

70,272 Lbs/day

Currently, UnitTherm

hrs. per day 9

days per week 5.5

days per year 300

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U-06998

PTO-003839

11,

Bowls

160 units / rack

1,650 lbs / rack

19,800 lbs / oven

10,000,000

X 1.15

→ 11,500,000 lbs RAW

580 cook cycles / YEAR

2.3 COOKS PER DAY
90 EFFICIENCY

(2.5) COOKS / DAY

(125%) only get 2 turns per day
with 11 hour cycle.

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U-06999

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	Mosquito	Hickory
8243	Y13 5 days	8254 Y6 12 days
	10.590	10.045
	.05 10.59	.055 9.99
	10.515 .025	9.9
	.24%	.92%
	Hickory	Hickory
8293	Y5 13 days	8284 12/26 (23 days)
	9.815	10.130
	.05 9.865	.05 10.08
	9.65	9.97
	1.2%	1.5%
	8292 36 days	
	9.585	
	.040 9.545	
	9.41	
	1.4%	

Monte

1. 1/4 breasts
2. bowl breast. reduced moisture - dates
3. bowl breasts. test for Hound
4. Look at the blender for a tree guard
5. Weighing off the bowl breast. &
Is it necessary?
6. New 1/4 breasts to Jim
7. Brent 3⁴ wings box
8. box for 7174
needed height 4 1/4"
9. Long getting sample in. working with Brent.
9. Cooking wings

824482 - 4/14

824302 - 0

824902 - 4/16

824702 4/15 4/14

824602 (4/15) 4/14

824632 - 4/15

7047-80 4/14

8290 - 4/17 ?

10. Most take a 7047-80 out of Jan 237 on hand
order - 4/21-270, 4/27-27, 4/28-189

Call Tom - wts on 8781

U-7880

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16 trap - 4 to 5 times the current over

225,000 - test model

If building have 32 trap

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U-7883

PTO-003844

Cooked Turkey Wings

170° F

chill to 10° F

300 " / hr

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U-7893

PTO-003845

PAGE 1 OF 11

GROUP: Meat Products

DIVISION: Sausage

SPECIFICATION NO.: 2614.50

PLANT: Fremont 199N

EDITION NO.: 1 DATE 2-14-86

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I. PRODUCT

1. ^{H.M.L. 1-PIECE LUNCHEON LOAF, C.C. 714, item 19844}
~~1-PIECE HORMEL LUNCHEON LOAF, c.c. 714, item 19844~~

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GROUP: Meat Products

DIVISION: Sausage

SPECIFICATION NO.: 2614.50

PLANT: Fremont 199N

EDITION NO.: 1 DATE FEB 10 1997

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II. FORMULA - PER 300 POUND BATCH OF MEAT.

1. Meat

	Reference Number	Pounds	Ounces
Skinned, Split Pork Jowls	RMAT 3270.02	88	0.0
Trimmed Beef Cheeks	RMAT 3161.00	88	0.0
Trimmed Pork Cheeks	RMAT 3291.00	62	0.0
Pork Hearts	RMAT 3350.00	62	0.0
Subtotal		300	0.0

2. Seasoning

Two bags per batch	SEAS 200003	7	12.0
(1-Seasoning, 7 pounds)			
(1-Hornel Cure, 12 ounces)			

3. Additives

Water	ADTV 1401.0	108	0.0
Wheat Flour	ADTV 0307.1	50	0.0
Nonfat Dry Milk	ADTV 0305.3	50	0.0
Sweet Pickles	RMAT 0203.1	38	0.0
Pimentos	RMAT 0506.1	17	0.0
Salt	ADTV 0703.3	9	0.0
Total		579	12.0

4. Raw material requirements

- Fresh beef, maximum age is 5 days from date of cut.
- Frozen beef, maximum age is 90 days from date of pack.
- Maximum temperature of fresh beef is 43° F.

5. Requirements for storage of spice

- The maximum storage time for blended spice will be 6 months to assure the quality of the spice.
- For any spice 6 months or older, the plant will be required to contact the Flavoring Department and Director of Grocery Products for proper disposition of the old spice.

Storage guidelines will be as follows:

- Best storage is at 40-45° F with a relative humidity of 50-55%, or less to maintain a 6 month shelf life.
- Storage at elevated temperatures will reduce the shelf life of the blended spice. For spices stored at 70° F and 80% humidity, the maximum storage time would be reduced to 2 months.

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GROUP: Meat Products

DIVISION: Sausage

SPECIFICATION NO.: 2614.50

PLANT: Fremont 199N

EDITION NO.: 1 DATE FEB 10 1987

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III. PROCESSING INSTRUCTIONS

1. Manufacturing

a. Raw material preparation.

- 1) Shovel formula required amounts of raw materials into stainless steel dump bottom buckets.
- 2) Transfer raw materials to chopping area.

b. Blending.

1) Batching/chopping.

- a) Meter 50°^F (desired temperature) water with a Neptune Water Meter (Model 432) into Buffalo Chopper (Model Mark V).
- b) Turn on chopper.
- c) Dump meat from buckets into chopper.
- d) Pour salt, seasoning, Hormel cure, wheat flour, and nonfat dry milk evenly over the meat while chopper is running.
- e) Chop approximately 1-1/2 minutes.

2) Emulsifying.

- a) Flow meat mixture from chopper into hopper of emulsifier.
- b) Emulsify meat mixture through Griffith Mincemaster using 2.5 mm and 1.2 mm size plates.
- c) Discharge emulsion into a stainless steel dump-bottom bucket on a dolly.

3) Mixing.

- a) Hoist dump-bottom bucket to Buffalo Mixer (Model 5BVSA or Model 6A5) and drop meat into it.
- b) Add pickles and pimentos to meat.
- c) Close lid on mixer, draw a vacuum of 15-18" inches.

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GROUP: Meat Products

PLANT: Fremont 199N

DIVISION: Sausag

EDITION NO.: 1 DATE 2-14-86**CONFIDENTIAL**

- d) Run mixer 4 minutes.
- e) Dump into sanitized St. John stainless steel dump-bottom bucket on a dolly.
- f) Transfer meat to stuffing area.

c. Stuffing.**1) Casing preparation.**

- a) Use 16-1/2 x 5 x 4" inch Abrams stainless steel pans.
- b) Grease pans with lard before filling.

2) Stuffing.

- a) Use 1 of the following stuffers to fill pans:

- i. Handtmann Stuffer (Type VF-325).
- ii. Handtmann Stuffer (Type VF-225).
- iii. Venag Stuffer (Model 3000).
- iv. Venag Stuffer (Model 1000).

- b) Use a Hormel-Modified 4 x 15" inch stuffing Horn for filling pans.
- c) Adjust stuffer to its maximum speed.
- d) Slightly overfill pan and form crown by hand.
- e) Using a stainless steel jig, trim perimeter of pan.

3) Hanging.

- a) Place 8 pans per shelf of hanging trolley.
- b) Fill 4 shelves per trolley for a total of 32 pans.
- c) Transfer trolley to smokehouse area.

2. Smoking/cooking**a. Prehandling.**

Place trolley into smokehouse.

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GROUP: Meat Products
DIVISION: Sausag

SPECIFICATION NO.: 2614.50
PLANT: Fremont 199N
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b. Cooking.

1) Suggested cook schedule:

<u>Time (Hrs.)</u>	<u>Dry Bulb (Deg.F)</u>	<u>Wet Bulb (Deg.F)</u>	<u>Relative Humidity</u>	<u>Smoke</u>	<u>Damper</u>	<u>Exhaust</u>
1	135	0	N/A	Off	Auto	Low
1	155	125	42%	Off	Auto	Low
1	170	140	45%	Off	Auto	Low
1	180	160	61%	Off	Auto	Low
2*	185	165	63%	Off	Auto	Low

* Time approximate - internal temperature must be 155°F degrees F before product can be removed from smokehouse.

2) Remove trolley from smokehouse.

c. Smoking.

- 1) Remove pans from trolley and dump loaf from pan.
- 2) Place loaves on stainless steel trolley.
- 3) Place trolleys in smokehouse.
- 4) Suggested smoke schedule:

<u>Time (Min.)</u>	<u>Dry Bulb (Deg.F)</u>	<u>Wet Bulb (Deg.F)</u>	<u>Relative Humidity</u>	<u>Smoke</u>	<u>Damper</u>	<u>Exhaust</u>
30*	110	0	N/A	Off	Auto	High
60	160	0	N/A	Off	Auto	High
10	180	0	N/A	Off	Auto	High
35	-	-	-	**	Closed	Off
30	160	0	N/A	Off	Auto	High
10	180	0	N/A	Off	Auto	High
35	-	-	-	**	Closed	Off

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SPECIFICATION NO.: 2614.50

GROUP: Meat Products

PLANT: Fremont 199N

DIVISION: Sausage

EDITION NO.: 1 DATE FEB 10 1967

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- * Use only if loaves are extremely cold.
- ** Atomize 2 ^{gals.} gallons of liquid smoke.
- 5) Remove trolley from smokehouse.
- d. Chill.
 - 1) Place trolley in a 38^{°f} degree ~~F~~ (desired temperature) cooler and hold overnight.
 - 2) Transfer trolley to packaging area.

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IV. PACKAGING

1. Prehandling

- a. Remove loaves from trolley and place on table.
- b. Using a Hormel-Modified Jig, cut loaves in half.
- c. Place a loaf into a 9-1/2 x 20" inch printed shrink bag CV-305. (see Purchasing Specification XXXXXX).
- d. Convey loaves to Cryovac Packaging System (Model 8300-B12) and place the loaf in the system.
- e. Convey loaves through Cryovac Submergible Shrink Cabinet (Model 8152). Desired water temperature is 195° degrees F, measured 4-6" inches above the conveyor. Product should NOT be run through cabinet if temperature varies below 195° degrees F or above 205, degrees F.

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GROUP: Meat Products

DIVISION: Sausage

SPECIFICATION NO.: 2614.50

PLANT: Fremont 199N

EDITION NO.: 1 DATE 2-14-86

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2. 1-PIECE HORMEL LUNCHEON LOAF, c.c. 714, item 19844
 - a. Form box CC-956. (~~Use~~ Purchasing Specification _____).
 - b. Place 1 loaf into box.
 - c. Convey box to Fairbanks Automatic Scaling System. Scale automatically weighs product to the lower tenth of a pound and prints a label with the weight, code date (which is date of pack), and item number. Use the standard 4-digit code date in which the first 2 digits indicate the month and the second 2 digits indicate the day of the month.
 - d. Place label from scaling system on end of box.
 - e. Close box and seal with two-inch gummed paper tape.
 - 1) Information printed on tape includes product description, item number, code date for date of packing, line and shift designations. Use the standard four-digit code date. The first two digits indicate the month and the second two digits indicate the day of the month.
 - f. Palletize boxes and transfer to cooler for storage and shipping.

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GROUP: Meat Products

DIVISION: Sausage

SPECIFICATION NO.: 2614.50

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V. STORAGE

Store product in a 34 degrees F (desired temperature) cooler.

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GROUP: Meat Products
DIVISION: Sausage

SPECIFICATION NO.: 2614.50
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VI. CHEMICAL ANALYSES

There is no routine program for chemical analyses on this product at this time.

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GROUP: Meat Products
DIVISION: Sausag

SPECIFICATION NO.: 2614.50
PLANT: Fremont 199N
EDITION NO.: 1 DATE 2-14-86

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VI
VII. MICROBIOLOGICAL ANALYSES

There is no routine program for microbiological analyses on this product at this time.

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To: M. Kalbassi
R. Goodey
P. Biddle
G. Gleeson

From: R. Starling
Date: 12 November 1992

cc: P. Key

REPORT ON TRIALS ON UNITHERM RAPIDFLOW 2 CONTINUOUS COOKER
10 NOVEMBER 1992

INTRODUCTION

The following report is a summary of trials undertaken on a Unitherm RapidFlow 2 continuous cooker at the manufacturer's premises, together with a discussion of the advantages and disadvantages of the machine, and suggestions as to the possible options available to Wisbech factory.

MACHINE DESCRIPTION

The Unitherm cooker differs from most other continuous cookers, in that it does not utilise "impingement cooking", whereby heat is transmitted to the product by direct impingement of high pressure hot air onto the surface of the product. The Unitherm cooker circulates hot air (with the option of added humidity via water spray) around the cooker, rather like a conventional domestic fan oven. This is carried out using baffled fans located along one side of the cooker, which draw air over electric heating elements, and circulate the heated air around the product, cooking the product from all sides. The cooking is carried out in three separate heating zones, which are independently temperature controlled.

TRIAL SUMMARY

The birds used were uninjected 2lb 12oz - 3lb 0oz, trussed ex Wisbech. Trials indicate that whole birds in this weight range can be satisfactorily cooked in the oven to acceptable deep muscle temperatures and cooked bone marrow in both the femur and backbone. Cooking time was of the order of 1 hour 13 minutes to achieve these criteria, although it is believed that this could be reduced to 1 hour by further trial work. Product colour was good, and even across most of the belt, although a marginal imbalance in air flow caused slight burning on one side of the birds on the left hand side of the belt. This can be cured by adjustment to fan baffles. Standard Padley spray (dextrose/xylose/crystal gum) was applied to all birds using a hand spray gun, giving two sprays to each side of each bird. The spray was proved to be critical to development of colour, unsprayed birds being yellow in colour, rather than standard golden/brown. Colour could therefore be controlled by automatic spray on the infeed section of the cooker.

DISCUSSION

The cooker subjected to trial was a 610mm wide belt feeding an 8m long oven. The original intention was to install a 1m wide belt oven, which, to achieve the desired 2000lb/hr throughput, would have to be 30m long. This cooker would cost in the order of £450,000. An option which is worth consideration, is to run two 8m long/610mm wide machines in parallel, which would have several advantages. Firstly, the length of the machine is more compatible with the available space proposed at Wisbech; secondly, two cookers would give greater product flexibility, enabling two products to be produced simultaneously; thirdly, throughput (in terms of whole birds of 3lb weight) would be increased to approximately 3000lb/hr; and lastly, the two cookers, because of economies of scale, would cost in the order of £350,000, giving a considerable saving. The only disadvantage which can be foreseen is the width of the available space at Wisbech.

12-92 TUE 12:01 G.M. PADLEY.CRITHN

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TRIAL DETAIL

TRIAL 1

4 birds, 2lb 12oz - 3lb 0oz, sprayed with standard Padley spray (dextrose/xylose/crystal gum), no spray to each breast, one to each leg.

Fed to cooker 2 x 2 on right hand side of belt, breast 1 ading.

Residence time 40 minutes, digital speed reading 0.80m/min.

Temperatures: zone 1 - 180°C set point

zone 2 - 270°C set point (high set point reading due to reverse air flow over heating elements)

zone 3 - 180°C set point

Product DMT 60°C - 65°C, colour good (P2), blood in backbone, marrow red.

TRIAL 2

4 birds, as per trial 1.

Residence time 50 minutes, digital speed reading 0.75m/min. (changed to 0.70m/min. after 28 minutes).

Temperatures: zone 1 - 180°C set point

zone 2 - 270°C set point

zone 3 - 180°C set point

Product DMT 78°C - 80°C, colour dark (P2-P3), blood in backbone, marrow red.

TRIAL 3

6 birds, as per trial 1. 2 rows of 2 sprayed, 1 row of 2 unsprayed.

Residence time 65 minutes, digital speed reading 0.60m/min.

Temperatures: zone 1 - 170°C set point

zone 2 - 265°C set point

zone 3 - 170°C set point

Product DMT 88°C - 95°C, colour good to dark (P2-P3) on sprayed birds, pale yellow on unsprayed birds. Marrow cooked on femur, blood present in backbone of 2 birds in 8.

TRIAL 4

6 birds, all sprayed, fed as in trial 1. Weighed raw at 16lb 14oz, cooked at 13lb 4oz, giving cook yield of 78.5%.

20 birds, all sprayed, fed in 5 rows of 4 across full width of belt.

Residence time 73 minutes, digital speed reading 0.54m/min.

Temperatures: zone 1 - 170°C set point

zone 2 - 265°C set point

zone 3 - 170°C set point

Product DMT 85°C - 95°C, colour good to dark (P2-P3), marrow cooked, no blood present in backbone of 12 birds sampled.

Slight burning of outer side of birds fed down left hand side of belt (in direction of feed).

R. STARLING - PROCESS DEVELOPMENT MANAGER

1-12-92 TUE 12:02 C.M. PADLEY.CRTHM

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CONFIDENTIAL**III. PROCESSING INSTRUCTIONS****1. Manufacturing****a. Preparation.**

- 1) Use fresh breast halves with the skin removed.
 - a) Fresh breasts may be held in a fresh cooler below 40 F for up to 7 days.
- 2) Breast halves must meet all raw material specifications.
 - a) Breast meat has been trimmed of all skin, blood, bones, and bruises.
 - b) No fillets will be used in this product.
- 3) If frozen product is used:
 - a) Place the breast halves in a plastic bag (30 lbs.).
 - b) Place bagged product in a bulk pack box.
 - c) Palletize and place into the freezer until ready to use.
 - d) Thaw the breasts in a stainless steel tank.
 - e) Run cold water continuously over the bagged product until thawed.
 - f) Store thawed breasts in a holding cooler under 40 F with ice.
 - g) Temperature of frozen/thawed product must not exceed 40 F.
 - h) Inspect frozen/thawed product to assure that all plastic from the bags has been removed.

b. Trimming.

- 1) Cut away any blood, bruises, and any other defects. (See In/Process Specs.)
- 2) Remove all skin using the skinner machine. Defat the skin (see skin defatting procedure) and place 50 skins per bag.

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GROUP: Meat Products

PLANT: Jennie-O

P-7760

DIVISION: Sausage/Turkey

EDITION NO.: 1 DATE DEC 02 1992

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- 3) Place the breast halves into plastic bags and place into a stainless steel tank. Cover with plastic and fill out identification card.
- 4) Transfer the breast halves and the skin to plant 1 for further processing.

2. Blending

- a. Transfer a tank of breast halves to the Weightronix Scale.
- b. Place an empty tank on the scale.
- c. Empty the bagged breasts from the bag and place them into the empty tank until there is 1000 lbs. of meat in the tank.
- d. Transfer the 1000 lbs. of meat to the Suhner Injector (Model WS-30).
- e. Mix the brine solution in the Groen Mixing Kettle, which has direct hook-up to the injector.
 - 1) Brine mixing procedure:
 - a) Fill the Groen Kettle with 100 gals. of water.
 - b) Start the Lightning Mixer on high speed.
 - c) Dissolve sodium nitrite into 1 gal. of water, in a separate container.
 - d) Add sodium phosphate.
 - e) Add sodium erythorbate.
 - f) Add sugar.
 - g) Add salt.
 - h) Add the dissolved sodium nitrite.
 - i) Mix until the solution is clear.
- f. Place the breast halves into the injector.
- g. Fill the injector with the injection solution.
- h. Start the injector and inject the meat.
 - 1) Inject the meat to 35% of the green weight.

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GROUP: Meat Products

PLANT: Jennie-O P-7760

DIVISION: Sausage/Turkey

EDITION NO.: 1 DATE DEC 02 1992

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- i. Place a roller tank under the injector outlet.
 - 1) Enter tare weight of tank before weighing.
 - j. Weigh the injected meat after tank is filled.
 - 1) If overweight, dip out solution until desired weight is obtained.
 - 2) If underweight, add solution to the batch until the desired weight is obtained.
 - k. Load contents into Challenge Tumbler.
 - 1) Tumble for 4 hours at 6.5rpm.
 - l. Dump the contents into a stainless steel tank.
 - m. Cover the tank with plastic and identify the contents with an identification card.
 - n. Store in the fresh cooler (under 40°F).
3. Stuffing
- a. Transfer a tank of tumbled breast halves to the tank dump.
 - b. Dump the product into a stainless steel holding bin.
 - c. Weigh and trim to meet approved weight requirements.
 - 1) 8.7 lbs. to 9.6 lbs.
 - 2) Ideally, 3 pieces/unit.
 - d. Place weighed portions into the conveyor pockets and convey to an operator.
 - e. For items 20670 and 11502 - Stretch a skin pattern to fit inside the Pioneer molded pocket. Place skins so that outside of skin is facing down (against the film).
 - 1) Item 16242 is skinless.
 - f. Place 2 breast halves on the skin, cut side facing up.
 - 1) For item 16242 - Place breasts directly in the mold, side-by-side with cut side facing UP.

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GROUP: Meat Products

PLANT: Jennie-O P-7760

DIVISION: Sausage/Turkey

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- 2) Pioneer machine makes the preformed pockets using Cry-O-Vac forming and non-forming films.
 - a) #T6160BA forming film (22-3/16 x 12) and #T6140BA non-forming film (20-3/4 x 12).
 - g. Place additional breast halves on top of the others with cut surface facing cut surface.
 - h. Convey through the Pioneer machine, where the machine heat-seals the non-forming film to the forming film.
 - 1) Pioneer machine settings are as follows:
280° F at 2-3 second intervals
 - i. Cut the packages apart by hand using a knife.
 - j. Convey the product through the Cryovac Shrink Tunnel (Model #8152-1-18).
 - 1) Ideal water temperature is 205° F \pm 5° F.
 - k. Check the packages for defects according to specifications.
 - 1) Skin-on items must have 90% skin coverage.
 - 2) Defective packages may be repacked.
 - l. Place the packaged product on a clean cooking rack.
 - 1) Place 16 packs to a layer, 10 layers to a rack.
 - 2) Product cannot touch each other.
 - m. Weigh the cook rack (less the tare of the rack) and record the information in production log as follows:

Weight
Blend Number
Cook Number
Units per Rack
4. Cooking
- a. Transfer racks of product from the fresh cooler to the Alkar Oven until oven is full.

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GROUP: Meat Products

PLANT: Jennie-O P-7760

DIVISION: Sausage/Turkey

EDITION NO.: 1 DATE DEC 02 1992**CONFIDENTIAL**

- b. Place a time/temperature chart into the controller on the instrument panel.
- c. Set the cycles on the oven as follows:

<u>Time (Hrs.)</u>	<u>Dry Bulb (Deg.F)</u>	<u>Wet Bulb (Deg.F)</u>
1	140	140
2	150	150
2	160	160
1.5*	170	170

* Until internal temperature reaches 158°F.

- d. Shower product with cold water for 1/2 hour.
 - e. Activate the blower for 10 minutes to dry product, after shower has been turned off.
 - f. Remove the product from the oven and transfer to a cooked cooler under 40 F.
5. Stripping
- a. Transfer the product from the cooked cooler to the Cryovac Packaging room.
 - b. Remove the product from the rack and place it on a stainless steel table.
 - c. Remove the plastic Pioneer packaging manually using a knife.
 - 1) Use care not to cut into the product.
 - d. Place a #882xF Tipper Tie netting over the product.
 - 1) Twist the end to get a tight fit.
 - 2) Tuck the loose end under the product and return product to the cooking rack.
 - a) Units must not touch each other.
 - e. Transfer the rack of product to a holding cooler under 40°F.

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GROUP: Meat Products

PLANT: Jennie-O P-7760

DIVISION: Sausage/Turkey

EDITION NO.: 1 DATE DEC 02 1992**CONFIDENTIAL**

6. Smoking procedures

a. For item 11502 (Hickory Smoked).

- 1) Wash the oven with SA 55 acid until the oven is clean. Rinse the oven thoroughly with water.
- 2) Activate the oven blower with heat to dry the oven.
- 3) Place mineral oil on the floor to prevent black specks caused by drippings from the rack.
- 4) Transfer racks of cooked and netted product to the Alkar Oven until oven is filled.
- 5) Insert the time/temperature chart and set the cycles for smoking as follows:

<u>Time (Min.)</u>	<u>Dry Bulb (Deg.F)</u>	<u>Wet Bulb (Deg.F)</u>
50	160	140
25	160	0
30	Smoke*	
25	170	0
25	Smoke**	
25	170	0

* Fill the atomizer with 1-1/2 gals. of liquid hickory smoke.

** At the end of cycle 3, fill the atomizer with 1-1/2 gals. of liquid hickory smoke.

- 6) Start the blower and the oven.

- a) Fresh air and external dampers must be closed!

- 7) Attach the atomizer machine (Model 100) to the oven.

- a) Fill the atomizer with 1-1/2 gals. of liquid hickory smoke.

- b) Set the air and the liquid pressure on the atomizer.

- i. Air pressure at 85 lbs.

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- ii. Liquid pressure at 55 lbs.

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GROUP: Meat Products

PLANT: Jennie-O

P-7760

DIVISION: Sausage/Turkey

EDITION NO.: 1 DATE DEC 02 1992

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- 8) At the end of cycle 2, smoke the product for 30 minutes, or until the liquid smoke is used up.
- 9) At the end of cycle 3, fill the atomizer with 1-1/2 gals. of liquid hickory smoke.
 - a) Set the air and liquid pressure. (See L-2)
 - b) Smoke the product for 25 minutes or until the liquid smoke is gone.
- 10) Complete cycle 4.
- 11) Check the product for color. (See color chart)
- 12) Remove the product from the oven and place it in a cooked cooler under 40 F.
- b. For items 20670 (Mesquite Smoked) and 16242 (Skinless).
 - 1) Repeat steps 1), 2), and 3) for "a." above.
 - 2) Transfer racks of product to the Alkar Oven until the oven is filled.
 - 3) Insert the time/temperature chart and set the oven cycles for smoking as follows:

<u>Time</u> <u>(Min.)</u>	<u>Dry</u> <u>Bulb</u> <u>(Deg.F)</u>	<u>Wet</u> <u>Bulb</u> <u>(Deg.F)</u>
60	140	0
50	Smoke*	
15	160	0
50	Smoke**	
30	160	0

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* Fill the atomizer with 3-1/2 gals. of liquid mesquite smoke.

** Smoke the product for 50 minutes, or until the liquid smoke is used up.

- 4) Start the blower and the oven.
- 5) Run cycle 1.

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- 6) Attach the atomizer to the oven.
 - a) Fill the atomizer with 3-1/2 gals. of liquid mesquite smoke.
 - b) Set the air and liquid pressure.
 - i. Air pressure at 85 lbs.
 - ii. Liquid pressure at 55 lbs.
- 7) Smoke the product for 50 minutes, or until liquid smoke is used up.
- 8) Let the product set for 15 minutes.
- 9) Run cycle 2.
- 10) Fill atomizer with 3-1/2 gals. of liquid mesquite smoke.
 - a) Set the pressure settings.
- 11) Smoke the product for 50 minutes, or until the liquid smoke is used up.
- 12) Let the product set for 15 minutes.
- 13) Start cycle 3.
- 14) Check the product for color. (See color chart)
- 15) Remove the product from the oven and truck it to a cooked cooler under 40 F until the product is 40 F or below.

7. Inspection

- a. All Hormel product is subject to a complete inspection by Quality Control personnel prior to packaging.

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The attached changes to Process Specification Number 3004.42
are hereby approved.

PURPOSE OF CHANGES:

To update the entire specification as requested by JENNIE-O.

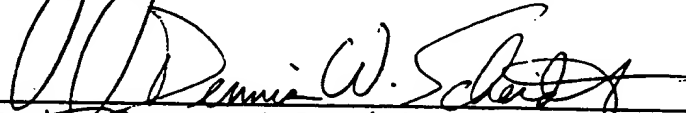
These changes affect the following pages of the basic specification:

The entire specification has been reprinted.



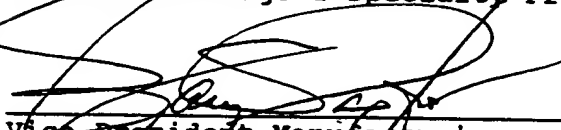
Product Manufacturing Manager, Dry Sausage - C.O.

11-30-92
Date




Director Sausage & Specialty Products Production

11-30-92
Date



Vice President Manufacturing

11-30-92 ✓
Date



Executive Vice President Operations - C.O.

12-2-92 ✓
Date

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As of 31 March '93

SALES ORDERS OUTSTANDING

Order No.	Customer	Date	Description	Total order value £	Invoice No.	Invoice date	Invoice to date £	Yet to invoice £	APRIL	MAY	JUNE
1416	Food Enterprise	7 Oct	Pasta cutter	44,000	2532	9 Oct	13,200	30,800		30,800	
1471	DA Halls	3 Dec	CIP for rapid flow	0				0			
1531	Stock		Sinks	0				0			
1539	Food Ent	5 Feb	Re-design	0				0			
1546	Stock	11 Feb	2 trolley steamers	0				0			
1561	Stock	19 Feb	Sinks	2,000				2,000			
1574	Slice Pak	26 Feb	conveyor belt	420				420			
1576	H & R Clegg	5 Mar	Sinks	1,015				1,015			
1588	Van Platers	19 Mar	Table & dollies	165,000				165,000			
1589a	USA Unitherm	19 Mar	Std tower press	276,000				276,000			
1589b	USA Unitherm	19 Mar	Tower press	69,000				69,000			
1589c	USA Unitherm	19 Mar	Ham pots	0				0			
1590	Stock	22 Mar	All racks	250				250			
1592	Wiltshire	23 Mar	Drainage covers	0				0			
1596	USA Unitherm	24 Mar	Tower press- sample	0				0			
1597	Wiltshire	24 Mar	Grating	540				540			
1599	DA Halls	24 Mar	Repairs	0				0			
1601	Unitherm	25 Mar	Outlet	0				0			
1603	Unitherm	25 Mar	Re corrugans	500				500			
1607	Kirbeck	30 Mar	All racking	790				790			
1608	Bristol Myers	31 Mar	Table	0				0			
				559,515			13,200	546,315	65,515	254,000	100,000 126,000
				0					0		

Check

Check

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SALES ORDERS - MARCH 1995

515 515 670

9. 2

PTO-003869

CONFIDENTIAL-ATTORNEY ONLY U-8180

UNITHERM STAINLESS STEEL INC.				PRODUCT:			SUPPLIED BY:			DATE:	
COOKING TRIAL DATA SHEET				TURKEY CRAWLS BOARDS HEAD						4/1/93	
TEST No.	BELT SPEED	COOK TIME	TEMPERATURES °C			START WEIGHT (lb)	COOKED WEIGHT (lb)	YIELD (%)	INTERNAL TEMP. °F	REMARKS.	
			ZONE 1	ZONE 2	ZONE 3						
1	THREE PASSES	16 MIN	275	300	300	7660	7280	95	41.7	DYEING OF OUTER SKIN 75% COLOUR	
2	21.5 Hz	10 1/2 MIN	315	350	300	6445	6375	96	41.6	SLIGHT BLISTERING 75% TOP COLOUR 25% BOTTOM	
3	21.5 Hz	10 1/2 MIN	315	350	300	WITH OIL COATINGS 4.12	3900	94.6	47.9	100% COLOUR TOP 50% COLOUR BOTTOM	
4	21.5 Hz	10 1/2 MIN	320	375	300	WITH SUGAR COATINGS 3.48	3295	94.6	48.2	BURNING OFF SUGAR IN PLACES	
5	19 Hz	11 3/4 MIN	320	375	300	6930	6630	95.6	42.1	BLISTERING OF SKIN 100% COLOUR TOP 50% COLOUR BOTTOM 1/2 1/2 CRACK	
6	19 Hz	11 3/4 MIN	320	375	300	6900	6485	93.9	41.7	REMOVED NEEDED AND TWO ZONE COOK	
7	8 Hz	19 MIN	320	375	300	7880	7365	94.2	41.4	100% COLOUR ON TOP SLIGHT BLISTERING REMOVED BUT NOT RE-BLISTERING	
8	8 Hz	2 ZONES 19 MIN	320	375	300	6900	6425	93.2	42.7	100% COLOUR ON TOP STILL SLIGHT BLISTERING 75% COLOUR BOTTOM	
9	8 Hz	2 ZONES 19 MIN	290	375	300	6885	6400	93.0	43.2	STILL BLISTERED ON TOP GOOD ON DEPEND COLOUR	
10	9 Hz	2 ZONES 16 1/2 MIN	290	360	300	7085	6665	94	47.2	NO BLISTERING GOOD TOP COLOUR 85% BOTTOM COLOUR	
11	9 Hz	16 1/2 MIN	290	360	300	7350	6945	94.4	44.3	VERY SLIGHT BLISTERING 100% TOP COLOUR 85% BOTTOM COLOUR	

OVEN LENGTH (PROCESS) - 26'

UNITHERM STAINLESS STEEL INC. PRODUCT:

COOKING TRIAL DATA SHEET

VARIED

SUPPLIED BY:

HATFIELD

DATE:

May 19, 1993

TEST No.	BELT SPEED	COOK TIME	TEMPERATURES °C			START WEIGHT	COOKED WEIGHT	YIELD	INTERNAL TEMP. °F	BELT LDG. REMARKS RAW LBS/FT ²
			ZONE 1	ZONE 2	ZONE 3					
INPUT 900-1000 lbs/hour LARGE LINK	#1 Sausage	7 minutes 8 seconds	200	300	265	2.17 (math)	2.210 (math)			12-15 Units (14) (14) 2.48ea 2.17lbs/FT ² (615)
	# 2 Sausage	7 minutes 8 seconds	200	320	270	2.06 (actual)	1.71	83%	155° - 160°	EXCELLENT COLOR/TEXTURE
	# 3 Sausage	7 minutes 8 seconds	200	320	270	4.805 (actual)	4.115	86%	160° - 162°	33 PCS
FINGER PORK SAUSAGE	1	4 minutes 23 sec.	200	333	250	1.245	1.15	92%	160°	1.245 - 21 PCS 24 PCS per FT 2
	(LEAN) 2	4 minutes 23 sec.	200	333	250	1.34	1.24	92%	162°	1.34 - 21 PCS
	3		170	300	200	1.55 (24)	1.435	93%	162°	
PATTIES			200	333	250	.6	0.53	88%	162°	7.5 PCS/SQ.FT. .9LB/FT ²
BACON	4	3 minutes	250	320	275					GOOD
SHANKS	5		175	275	175					WEIGH IN BEFORE SMOKE
KNUCKLES	6		175	275	175					WEIGH IN BEFORE SMOKE
RIBS	7		175	275	175		15.375lbs 4	74%		WEIGH IN BEFORE SMOKE

PTO-003871

U-02849

OVEN LENGTH (PROCESS) - 26'

UNITHEM STAINLESS STEEL INC. PRODUCT:

DATE:

May 19, 1993

COOKING TRIAL DATA SHEET

VARIED

SUPPLIED BY:

HATFIELD

TEST No.	Belt Speed	Cook Time	TEMPERATURES °C			START WEIGHT	COOKED WEIGHT	YIELD	INTERNAL TEMP. °F	Belt IDG. REMARKS RAW LBS/FT ²
			ZONE 1	ZONE 2	ZONE 3					
INPUT 900-1000 lbs/hour LARGE LINK										
#1 Sausage	30.26	7 minutes 8 seconds	200	300	265	2.17 (math)	2.210 (math)			12-15 Units (14) (14) 2.48ea 2.17lbs/FT ² (615)
# 2 Sausage	30.26	7 minutes 8 seconds	200	320	270	2.06 (actual)	1.71	83%	155°-160°	EXCELLENT COLOR/TEXTURE
# 3 Sausage	30.26	7 minutes 8 seconds	200	320	270	4.805 (actual)	4.115	86%	160°-162°	33 PCS
1 FINGER PORK SAUSAGE	49.74	4 minutes 23 sec.	200	333	250	1.245	1.15	92%	160°	1.245 - 21 PCS 24 PCS per FT 2
(LEAN) 2	49.74	4 minutes 23 sec.	200	333	250	1.34	1.24	92%	162°	1.34 - 21 PCS
3	30.21		170	300	200	1.55 (24)	1.435	93%	162°	
PATTIES	49.74		200	333	250	.6	0.53	88%	162°	7.5 PCS/SQ.FT. .9LB/FT ²
BACON	69.97	3 minutes	250	320	275					GOOD
SHANKS	17.16		175	275	175					WEIGH IN BEFORE SMOKE
KNUCKLES	17.16		175	275	175					WEIGH IN BEFORE SMOKE
RIBS	17.16	14 mins	175	275	175	15.375lbs / 4	11.375	74%		WEIGH IN BEFORE SMOKE

U-02850

PTO-003872